

What is claimed is:

1.       An electric power steering apparatus for giving steering assist force to a steering mechanism of a vehicle by driving an electric motor on the basis of a current target value that is determined in accordance with a manipulation for steering the vehicle, the electric power steering apparatus comprising:

        a rotation speed detecting unit which detects a rotation speed of the electric motor;

        a compensation current determining unit which determines an instruction value of a compensation current to flow through the electric motor to suppress torque ripples due to distortion of an induced electromotive force waveform of the electric motor in accordance with a load correspondence quantity as a physical quantity corresponding to a load of the electric motor and the rotation speed detected by the rotation speed detecting unit;

        a correcting unit which corrects the current target value on the basis of the compensation current instruction value determined by the compensation current determining unit; and

        a control unit which performs a feedback control on the electric motor so that a current having the current target value as corrected by the correcting unit flows through the electric motor, the control unit being part of a current control system of the electric motor that uses the feedback control.

2. The electric power steering apparatus according to claim 1, wherein the compensation current determining unit includes:

an amplitude determining unit which determines an amplitude of the compensation current instruction value so that an amplitude of the compensation current to flow through the electric motor becomes proportional to the load correspondence quantity; and

an amplitude correcting unit which corrects the determined amplitude in accordance with the rotation speed so as to compensate for a gain reduction due to a frequency characteristic of the current control system.

3. The electric power steering apparatus according to claim 2, wherein the compensation current determining unit includes a phase correcting unit which corrects a phase of the compensation current instruction value in accordance with the rotation speed so as to compensate for a phase delay due to the frequency characteristic of the current control system.

4. The electric power steering apparatus according to claim 1, wherein the compensation current determining unit includes:

an amplitude determining unit which determining an amplitude of the compensation current instruction value so that an amplitude of the compensation current to flow through the electric motor becomes proportional to the load correspondence

quantity; and

a phase correcting unit which corrects a phase of the compensation current instruction value in accordance with the rotation speed so as to compensate for a phase delay due to the frequency characteristic of the current control system.